



Draft 2020 State Water Resources Plan Public Informational Webinar – Q&A

1. What sustainable sources of fresh water has Frederick County identified to supply the very rapid population growth in Winchester and Frederick County?

Frederick County is included in the Northern Shenandoah Regional Water Supply Plan, which identifies several sources including raw water storage in quarries, groundwater wells, and purchases from the City of Winchester. Since the Plan submittal, Frederick County Sanitation Authority was issued a permit to construct an intake and water treatment plant on Opequon Creek, which has maximum daily limit of 8 million gallons per day (8 MGD). Additional information on the Northern Shenandoah Plan or the Opequon Creek permit are available upon request.

2. Please share your analysis of the regional impact of increasing groundwater use and large water uses in Augusta County which impacts the base flow of surface water in the karst geology of the Shenandoah Valley.

Augusta County is within the Upper James Minor Basin (pg. 171). Groundwater demands in the watershed are projected to increase by approximately 11% by 2040. Because Augusta County is located in a karst geology area and not in either of the groundwater management areas, cumulative impact analyses of groundwater impacts were not completed. A cumulative impact analysis of surface water (including impacts to overall flow) was conducted for the basin and is included in the report in Appendix A Minor Basin Focuses. Although DEQ Geologists do study the fractured rock aquifer systems located west of Interstate 95, these studies are localized and limited by resources available to complete them. As a result, the fractured rock aquifers are not well understood in many parts of Virginia. Evaluating the impact of increasing demands in fractured rock aquifers is outside the scope of the Draft State Plan and would require a localized study of the area.

3. Has Frederick County done a cumulative impact analysis to account for impacts from climate change and the 30-day drought scenario and the every 20 year cycle of more severe droughts that we have experienced in the Shenandoah Valley?

Although DEQ is not aware of any such analysis, Frederick County would be the best contact for this question. Note that the evaluations of the impact of climate change on surface waters as included in the Draft State Plan are new, and few if any localities will have done similar evaluations at local scale.

4. Does the plan include any consideration of subsidence with Groundwater Withdrawals?

Cumulative Impact Analyses were conducted for areas within Groundwater Management Areas (see Chapter 4, section 4.3 pg. 84-103). However, these evaluations do not and were not intended to simulate land subsidence. The best method for evaluating land subsidence is through the use of extensometers, of which Virginia has several located near the cities of Franklin, Suffolk, and one newly constructed at the Hampton Roads Sanitation District (HRSD) Nansemond Water Treatment Plant. Groundwater withdrawals do impact land subsidence in Virginia, although it is not the only factor. Subsidence in the Virginia Coastal Plain varies between 1.1 millimeters per year to 4.8 millimeters per year. More information can be found on the [USGS website](#).

5. Will slides be available?

Slides are available upon request and were sent out to all registrants of the webinar.

6. Does the Lake Manassas river run take into account the UOSA flows returned?

Yes, it does.

7. Richness change comment...many other variables that will impact richness such as growth in impervious surfaces.

Please note that public comments on the Draft State Plan must be provided by email or mail. Comments received during the webinar will not be considered public comment. DEQ agrees that the volume of water flowing through streams is only one factor that can affect species richness, and impervious areas within a watershed can lead to degraded aquatic communities. However, because the Draft State Plan focuses on issues surrounding the use of water supply resources, the analysis presented within pertains specifically to the impact on species richness due to decreases in stream flow. Impervious surface in the Washington Metropolitan area is a dominant factor in flow alteration in local tributaries, and has direct effects on estuarine water quality during storm events. However, during drought periods water supply activities are by far the greatest factor currently affecting water availability in the non-tidal portions of the Potomac River. Drought periods are emphasized in the water supply planning program, and by extension in the Draft State Plan, because impacts to water resources and beneficial uses during droughts were the basis for the program's development.

With respect to land use conversion to impervious area and its relation to flow-ecology, it is important to note that while increases in impervious area can alter the flow regime, this alteration generally involves an increase in overall flow due to increased storm flow volumes. Also, studies thus far have not separated the negative impacts on aquatic communities stemming from hydrograph alteration from the negative impacts of urban nonpoint source pollutants. Therefore, it is important to consider impervious area in a context beyond changes in flow regimes.

8. Comment...too much emphasis on ecology, this is a water supply report.

Please note that comments must be provided by email or mail. Questions received during the webinar will not be considered public comment. However, [9VAC25-780-140.G](#) states that the State Water Resources Plan will include a cumulative demand analysis and an evaluation of potential use

conflicts among projected water demands and estimates of requirements for in-stream flow. Requirements for instream flow are developed with consideration of impacts to aquatic life. The efforts in the Draft State Plan represent the first application of a new methodology that may be useful in estimating instream flow requirements in a more efficient and accessible way than through traditional habitat studies.

9. The ChesBay model does not take into account the upper reservoir management system already in place to augment low flows; how will that be incorporated into your analysis

The Chesapeake Bay model hydrology is used only as the source of rainfall and runoff for the VAHydro model. Reservoir operations for the impoundments in the Potomac River are constructed in the VAHydro model to simulate the water quality augmentation flows from those reservoirs (such as Jennings Randolph) that provide storage to the Washington D.C. metro area utilities. Because of the complex, collaborative nature of determining Co-Op low-flow releases, it was not feasible to simulate low flow releases for water supply in the modeling completed for the Draft State Plan. However, the "potential unmet demand" model estimates in the Lower Potomac River represent withdrawals that would be curtailed in order to meet the minimum instream flow conditions at Great Falls and Little Falls. Therefore, the potential unmet demand estimate should be viewed as potential low flow releases needed from the upstream reservoirs to meet instream flow targets and offstream demands during drought periods.

10. Are the climate change scenarios used in the State Water Plan similar or different from those used by ICPRB in metro-DC Potomac River Basin modeling? Were any other comparisons to the CO-OP's 2020 demand report made?

The future climate model scenarios in the 2020 Virginia State Water Plan differed in approach to that of the ICPRB 2020 Water Supply Report, but the two studies drew from the same set of publically available global climate model data sets. The ICPRB model used a statistical method of downscaling global climate model projections to a stream gage based daily streamflow, whereas the Virginia DEQ models employs a process based and temperature corrected rainfall-runoff model calibrated to gage flows to produce daily streamflow time series. As a consequence, the ICPRB study time period stretched over a larger period of time than the Virginia analysis, while the Virginia model is capable of examining the interactions between land use and low flows, as well as impacts on small and large streams. Ultimately, both models produced a wide range of potential climate related impacts ranging from increasing drought flows to decreasing drought flows. In the "dry scenarios", the models were very similar, with the 2040 ICPRB model predicting a 27% decrease in extremely dry years, and the VAHydro model predicting a 31% decrease in the lowest 90-day flow simulated. The median scenario from both models produced similar results as well, with the ICPRB model showing a 5% increase in extremely dry years, and the VAHydro model predicting a 4% increase in the lowest 90-day flow simulated. The largest differences between the two models came in the "wet scenario" where the ICPRB model predicted an 8% increase in dry year flow, whereas the VAHydro model predicted an increase of nearly 90% in the lowest simulated 90-day flow.

It is important to note that in the 2020 ICPRB report, it was indicated that the Chesapeake Bay watershed model used the Hamon method of evapotranspiration simulation, and that there is some

evidence that this method may overestimate the effect of extremely high temperatures. This limitation was addressed in the version of the model that VAHydro employed for climate simulation, which used the Hargreaves-Samani method to scale baseline estimates of evapotranspiration due to increasing temperatures.

11. Thanks for an exceptionally informative presentation of the tool. Is DEQ staff available for preliminary evaluations/modeling of project proposals – prior to the submittal of a formal VWP permit application package?

Prior to submitting a VWP permit application, applicants are required to do a pre-application meeting with DEQ to go over the application process. In addition to the required meeting, applicants can request a pre-application panel with DEQ and other state agencies to go over concerns that may arise during the permit process in advance. Due to limited staffing resources to address projects already under review, DEQ staff do not generally complete modeling evaluations prior to application submission.

12. What is MGD?

MGD stands for million gallons per day.

13. Can any steps be taken to make the data centers to pay for their own water use and reduce their water use?

Financial arrangements related to the sale or purchase of water from or by water utilities is not within the purview of DEQ or the Draft State Plan. Questions about such arrangements are best addressed to local government or the relevant water utility. Local and Regional Water Supply Plans are required to address water demand management, including information related to current and future plans for reducing water use.

14. What is the relationship between Manassas Park water purchase and DEQ? How can Manassas Park become more “water-independent”? Our water fees are fierce! Thank you.

Water purchases are generally reported to DEQ as water transfers, but the financial arrangements related to such transactions are outside the purview of DEQ. Questions related to whether a specific service area can pursue developing an alternative source are best directed to the corresponding local government or water utility.

15. What is the possibility of Lake Manassas’s water supply being drained or lowered due to the great amount of consumption by so many users?

Based on current projections, the demands on Lake Manassas are expected to exceed the current estimated “safe yield” of the reservoir by 2040. Addressing this would require reducing demands below the projected amount, increasing storage and/or alternative supplies for this system. Table 77 on page 403, and the narrative on page 405 of the Draft 2020 State Water plan discusses this briefly.

16. Does clearing forest life impact streamflow in a negative way? And if so, how so? Thank you.

Literature on this subject does suggest changes to land use, such as deforestation, can impact streamflow. While this type of analysis is not within the scope of the Draft State Plan Water Resources Plan, the VAHydro model does consider land use. The VAHydro model simulates streamflow with inputs such as precipitation, climate, land use, and topography, as well as local data collected through Local and Regional Water Supply Plans and reported water use submitted to DEQ through the Annual Water Withdrawal Reporting program.

Additional Notes

This Q&A document contains responses to questions received during the State Water Resources Plan Webinar on July 8, 2021, Note that questions/comments received during the webinar cannot be considered public comments. Public comment can be submitted in writing during the comment period (June 28 – Aug 13, 2021) by email to hannah.somers@deq.virginia.gov, or by mail to Hannah Somers, VA DEQ, Office of Water Supply, at P.O. Box 1105, Richmond, Virginia 23218.

The Draft 2020 State Water Resources Plan is available from June 28 – Aug 13 at:
<https://www.deq.virginia.gov/water/water-quantity/water-supply-planning/virginia-water-resources-plan>